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(71) Applicant: **TOSHIBA CORP**

(72) Inventor: **ARIKADO TSUNETOSHI**

(74) Representative:

(54) DRY ETCHING DEVICE

(57) Abstract:

PURPOSE: To perform fine working to the order of submicron easily with high accuracy by using a light transmittable mask substrate with a secondary electron release pattern of a photoemitter layer on the surface in a direct electron beam drawing method.

CONSTITUTION: A mask substrate 9 is disposed in the position opposite to an object 7 to be etched placed on the sample stage 6 in an etching chamber 1. The substrate 9 is formed of a glass substrate 9a, a thin film 9b of Cr or its oxide, and a photoemitter 9c suh as CsI, and is formed with a desired mask pattern. Caseous XeF2 is introduced into the chamber 1, a magnetic field is applied in the direction perpendicular to the object 7 surface by an annular electromagnet 11 and high voltage is applied between the stage 6 and a support member 8, that is, emitter 9c, by a DC electric power source 12. Further, UV light or the like is irradiated to the substrate 9 with a lamp 10, and the secondary electrons released from the emitter 9c are converged by said magnetic field and electric field and the converged electrons are irradiated to the object 7, whereby the pattern is transferred and the object is etched. Hence, the degradation in working accuracy owing to the low dry etching resistance of the resist is prevented.